

REMARKS

Claims 1-9 and 42-81 are rejected. Claims 1, 49, and 66 have been amended. No claims have been cancelled or added. Claims 1-9 and 42-81 remain pending. Favorable reconsideration and allowance of this application is respectfully requested in light of the following remarks.

I. Claim Amendments for the Purposes of Form and Clarity

Claims 1, 49, and 66 have been amended to change the term “movable portion” to “wafer portion” for consistency throughout claim 1. Furthermore, the term “around the periphery” has been amended to read “at the periphery” to clarify the location of the wafer portion that is etched.

Applicant asserts that this amendment has been made for the purposes of form and clarity, and not for reasons related to patentability. Applicant further asserts that this claim amendment thus does not raise any new issues with respect to patentability. Accordingly, Applicant respectfully requests that these claim amendments be entered into the present application.

II. Claim Rejections for Double Patenting

Claims 1-9 and 42-81 are rejected under the doctrine of obviousness-type double patenting as being unpatentable over claims 1-57 of co-pending Application No. 09/843,545. In particular, it is stated in the Office Action that the claim term “without the need for substantial undercutting” as recited in the present application is equivalent to the claim term “removing a portion” as recited in the ‘545 application. Accordingly, the Office Action concludes that the present application and the ‘545 application are not patentable distinct.

Applicant does not comment either way with respect equivalence, or non-equivalence, of the two claim terms identified in the Office Action. Rather, Applicant notes that the claims of the present application and the claims of the ‘545 application recite wholly different inventions.

A. Summary of the Present Application

The disclosure of the present application will now be described generally. The following description is not intended relate directly to the claims, but rather to provide an overview of the disclosure. A discussion of the pending claims is discussed below.

The present application discloses a MEMS device including an underlying substrate having an upper surface that supports the MEMS components formed from a wafer. The MEMS components include a movable MEMS structure and a stationary MEMS structure that define a variable-sized gap therebetween.

The movable MEMS structure can be formed by etching a recess into the upper surface of the substrate prior to attaching the wafer to the upper surface of the substrate to create an internal void. The wafer can then be etched down into the void to release the movable MEMS structure from the rest of the wafer. The wafer is thus suspended above the substrate due to the recess formed in the upper surface of the substrate, as illustrated in Fig. 10.

B. Summary of Application No. 09/843,545

The disclosure of the present application will now be described generally. The following description is not intended relate directly to the claims, but rather to provide an overview of the disclosure. A discussion of the pending claims is discussed below.

The '545 application also discloses a MEMS device including an underlying substrate having an upper surface that supports the MEMS components formed from a wafer. The MEMS components include a movable MEMS structure and a stationary MEMS structure that define a variable-sized gap therebetween.

The movable MEMS structure, however, is formed using a method that differs from the present application, thereby creating a MEMS structure that also differs from the present application. In particular, the movable MEMS structure can be formed by providing a recess in the *lower surface of the wafer*, as opposed to the upper surface of the substrate, prior to attaching the wafer to the substrate. The recess can be provided either by 1) etching directly into the lower surface of the wafer and attaching the wafer to the substrate, or by 2) attaching spacer members to the periphery of the wafer to form a recess between the spacer members when the spacer members are attached to the substrate.

Accordingly, a movable MEMS structure is suspended over the substrate due to a recess formed in the wafer that forms the movable MEMS structure (as opposed to a recess in the supporting substrate). An example of this structure is illustrated in Fig. 1 of the '545 application.

C. Claims of the present application compared to the '545 application

The claims of the present application recite limitations that are patentably distinct from the claims recited in the '545 application. The present application includes three independent claims, namely claims 1, 49, and 66.

The '545 patent presents four independent claims, namely claims 1, 35, 45, and 57.

Each of presently pending claims are discussed below with respect to claims pending in the '545 application.

1. Pending Claims 1, 46, and 66 of the Present Application:

Claims 1, 46, and 66 all recites a method for fabricating a MEMS structure. In particular, steps (A)-(C) all generally recite the steps of forming a recess in an upper surface of a substrate, and attaching an etchable wafer to the upper surface of the substrate. Step (C) recites etching downward into the wafer at the periphery of the wafer portion to break through into the recess.

2. Pending Claims of the '545 Application

The claims are discussed below, with italics added for emphasis.

Claim 1 recites a method for fabricating a MEMS device on a substrate. Steps (B)-(C) recite the steps of *forming a recess into the first surface of the wafer* to produce a spacer member disposed outwardly from the recess. The spacer member is then attached to the substrate prior to removing a portion of the wafer.

Claims 35 recites the steps of depositing a first layer onto the first surface of the wafer, and depositing a spacer member onto the first layer. *A middle portion of the spacer member is removed to form a recess* between the remaining spacer material. The remaining spacer is then attached to the substrate.

Claims 45 and 57 recite the steps of depositing a spacer material onto the first surface of the wafer, and *forming a recess within a middle portion of the spacer material*. The spacer material is then attached to the substrate.

D. Conclusion with Respect to the Double Patenting Rejection

Clearly the claims pending in the present application are directed to forming a recess in an upper surface of the substrate prior to attaching a wafer to the substrate, while the

claims pending in the '545 application are directed to forming either in the wafer, or in a spacer material attached to the wafer. The methods claimed in the two pending applications thus do not recite steps that are obvious variations of each other and, in fact, produce differing structures, as discussed above.

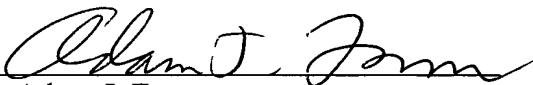
Withdrawal of the rejection of claims 1-9 and 42-81 on the grounds of obviousness-type double patenting is therefore respectfully requested.

III. Conclusion

Applicant therefore respectfully asserts that all rejections and objections have been overcome. Accordingly, the application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

No fee is believed to be due with this communication. However, if any fees are deemed due, Applicant hereby authorizes the Commissioner to deduct said fees from deposit account No. 17-0055. The Examiner is invited to contact the undersigned at the telephone number appearing below if such would advance the prosecution of this application.

Respectfully submitted,

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